Introduction to Evidence-based Healthcare

NEHC EBHC Workshop

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What's Ahead?

- What is EBHC?
- Why evidence-based healthcare (EBHC)?
- How can I practice EBHC?
- How can EBHC be supported?

What is evidence-based medicine?

"Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values."

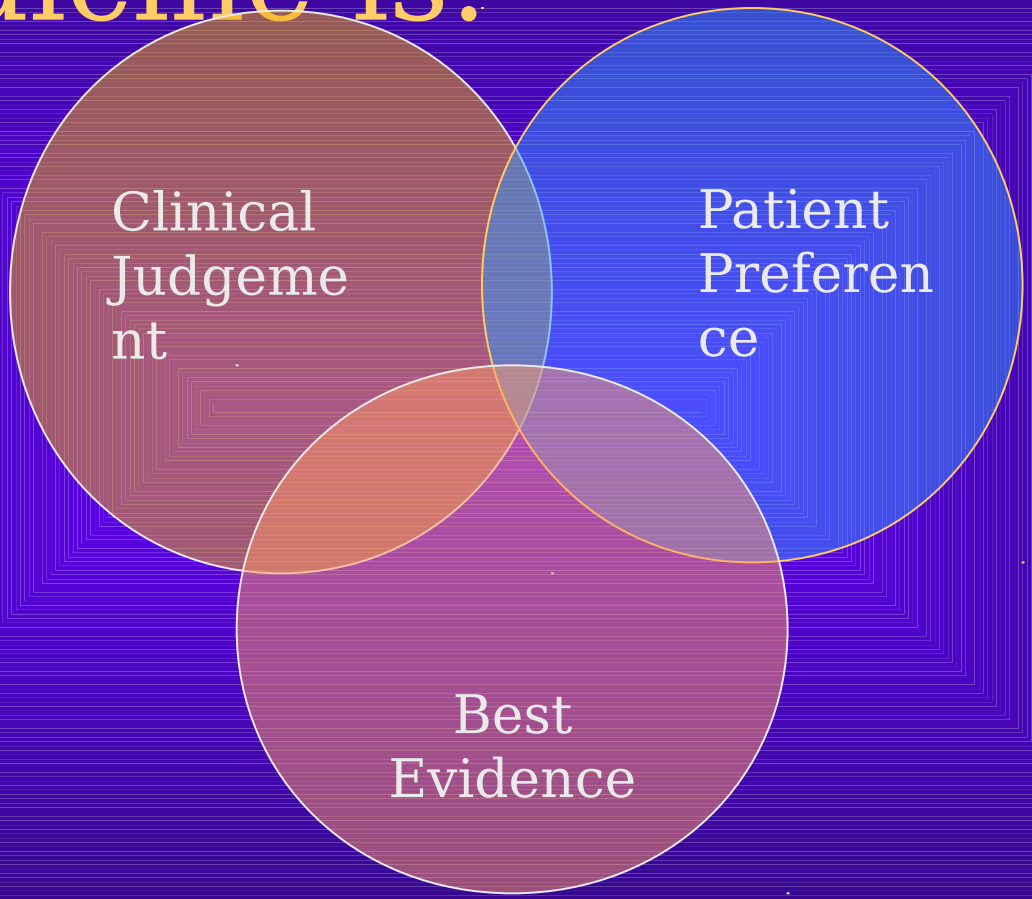
David Sackett

What is evidence-based medicine?

- Where there is evidence of benefit and value, do it
- Where there is evidence of no benefit, harm, or poor value, don't do it.
- When there is insufficient evidence to know for sure, be conservative

David Eddy

What evidence-based medicine is:

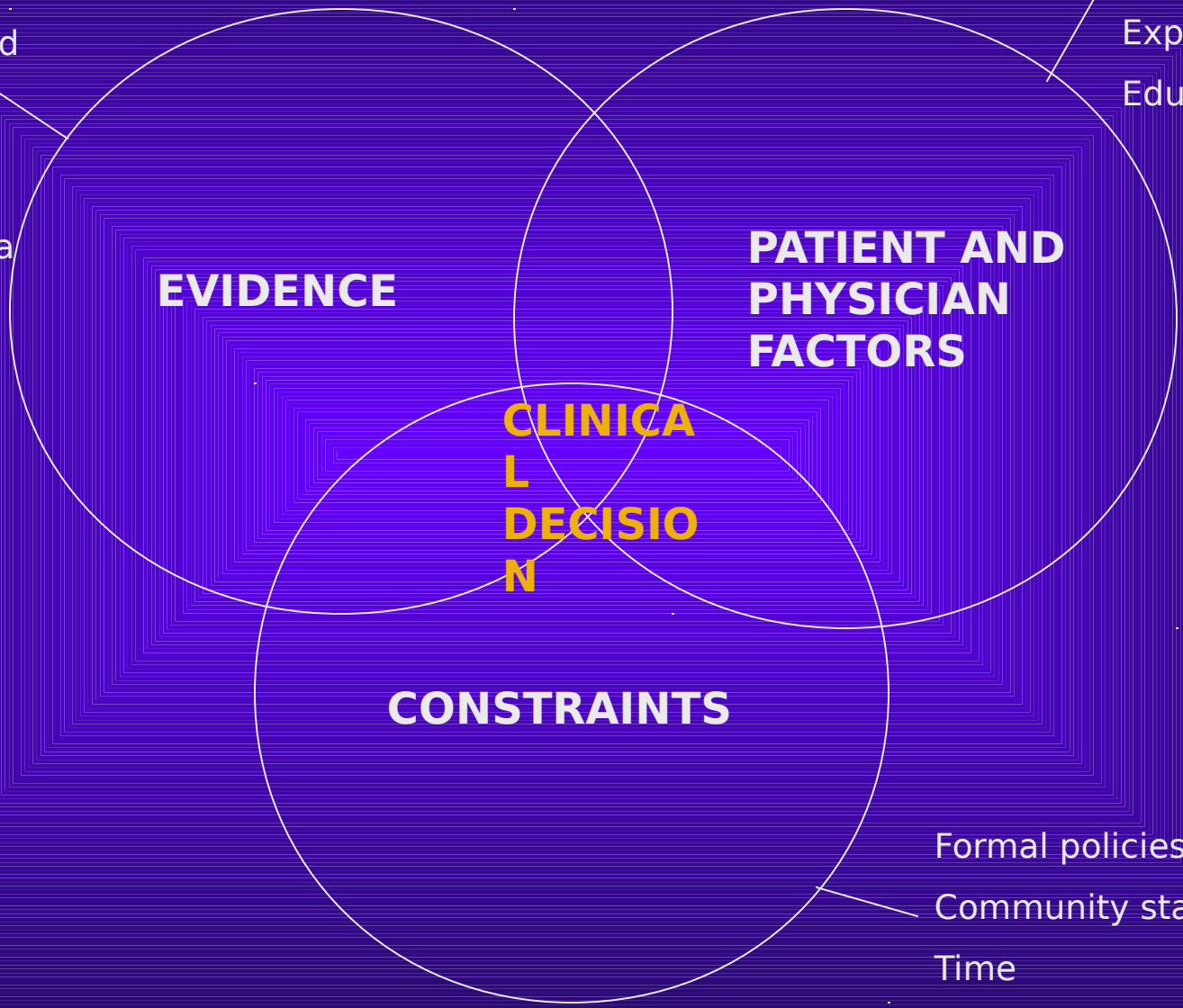


Evidence-based Healthcare

- EBM is focused on individual practice
- EBHC is an organizational issue requiring:
  - Organization
    - Able to generate evidence
    - Flexibility to incorporate evidence
  - Individuals and teams
    - Able to find and appraise evidence
    - Open to apply evidence to patient care

Muir Gray, 1997

Clinical Decision Spheres of Influence



Why is EBHC Needed?

- Decay of clinician knowledge over time
- Human cognitive biases
- Inefficient transfer of knowledge to practice
- Organizational need to decide between effective and ineffective therapies

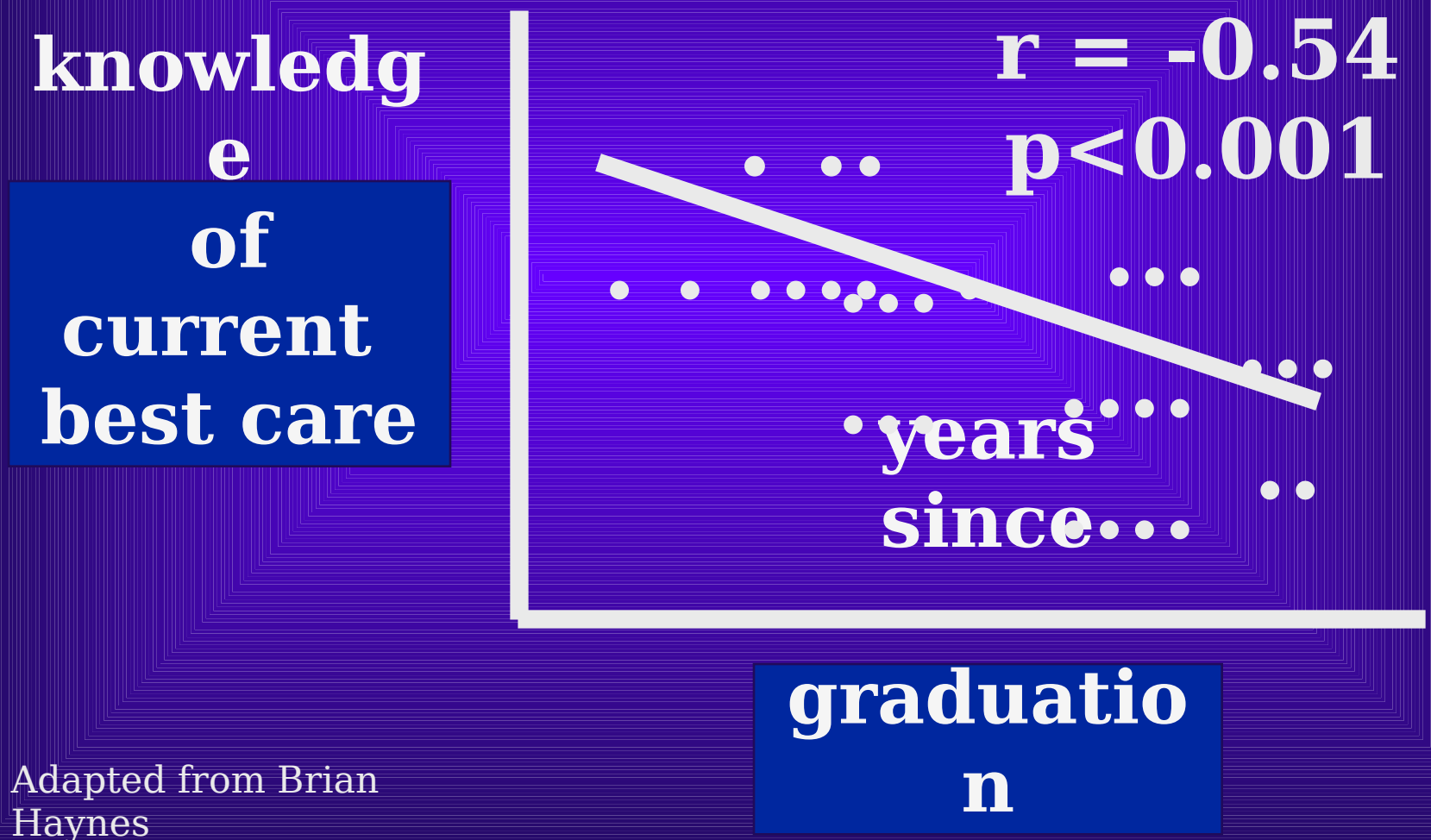
Knowledge Decay – Information Explosion

- >30,000 new citations added to Medline every month
- Volume of medical information doubles every 19 years

The Inevitable Consequence: Knowledge Decay

On average, the clinically-important knowledge of physicians deteriorates rapidly after completion of training.

Knowledge Decay - The Slippery Slope



Adapted from Brian Haynes

How sure are we?

Expert estimates of breast implant rupture rates

0% 0.2% 0.5% 1% 1% 1% 1.5% 2% 3% 3% 4%

5% 5% 5% 5% 5% 5% 5% 5% 6% 6% 6% 8%

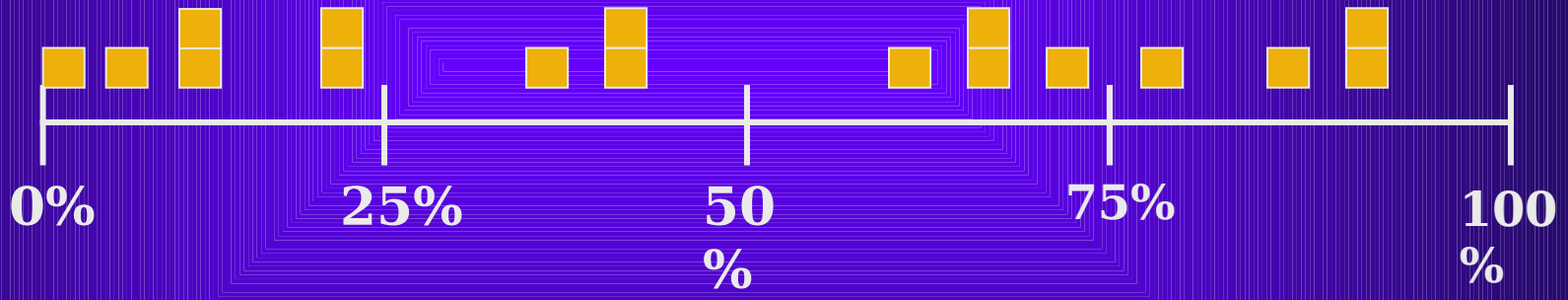
10% 10% 10% 10% 13% 13% 15% 15% 18%

20% 20% 20% 25% 25% 25% 30% 30% 40%

50% 50% 50% 62% 70% 73% 75% 75% 75%

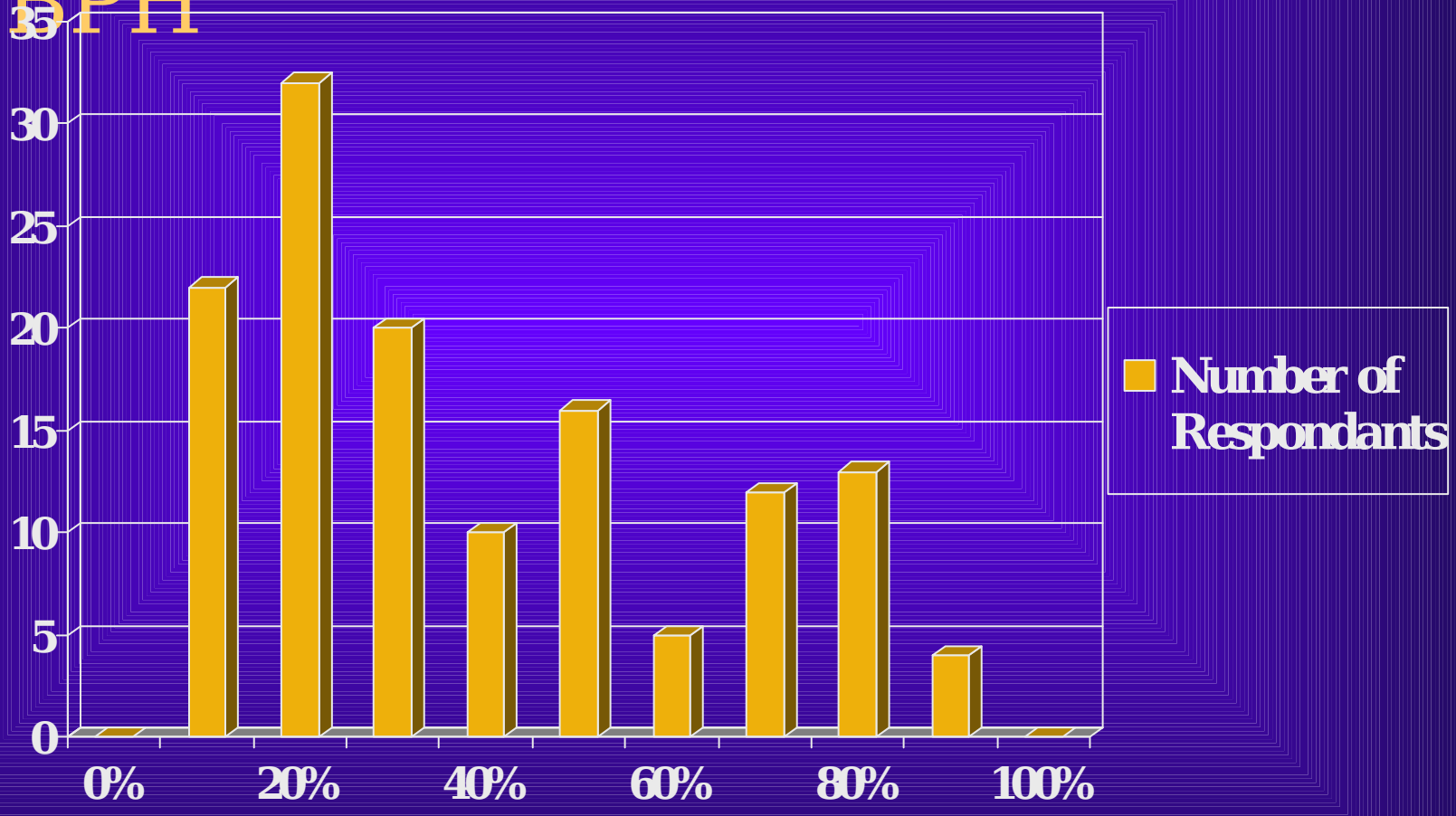
Source: Dr. David Eddy

Experts estimates of the effect of colon cancer screening on chance of dying



Source: Dr. David Eddy

Experts' estimates of probability of acute retention in men with BPH



Source: Dr. David Eddy

Cognitive Biases

- In fact we are not very good at converting facts into accurate beliefs and actions
  - Complexity of medical practice
  - Complexity of research
  - Limitations of the human mind
  - Personal & professional biases

Inefficient Knowledge Transfer

- Medical recommendations
  - 2-23 year delay in recommending valid interventions (JAMA 1992 and 1995)
- Geographic variations in care
- Persistent gaps in quality of care
  - Only about half of recommended care delivered across all dimensions in US (NEJM 2003)

Deciding on Effective Therapies

- Many interventions have marginally increased benefit but significantly increased costs
  - TPA – 1% mortality benefit
  - Liquid based cytology - ?benefit but 8x cost
- Some common procedures may have questionable benefit
  - High dose chemo & BM transplant for BRCA

Summary thus far

- Clinicians need information, but most needs are never met.
- Consequently, knowledge and performance deteriorate.
- Traditional instructional CME doesn't improve performance.
- Our unaided minds are fallible, even when we *know* the evidence.
- Knowledge transfer is inefficient leaving quality gaps and geographic variations in care

Which leads to

- Wide variation in perceptions
- Wide variation in practice
- Much higher rates of inappropriate care than any of us would like to admit

Any alternative to evidence as the bedrock for

medicine must account for these

How can clinical performance can keep up to date?

- Appreciate the limitations of judgements, beliefs and biological models
- Learn how to practice evidence-based medicine
- Seek and apply evidence-based practice summaries generated by others.
- Accept evidence-based practice protocols developed by our colleagues.

What does evidence-based mean?

- A comprehensive, systematic, open minded review of all the evidence
- The evidence determines the conclusion, not vice versa
- Not, the citation of papers supporting a preformed conclusion (and trashing of those that don't)
- Not, the use of evidence when it is 'positive' but judgement when it isn't

What is “good evidence”

- Directly or indirectly demonstrates treatment effect on *health outcomes*
  - beware of biological outcomes
- Includes *good controls*
  - “beyond any reasonable bias”

How Can I Practice EBHC?

- Convert information needs into answerable questions
- Track down, with maximum efficiency, the best evidence to answer questions
- Critically appraise the evidence for validity
- Apply the results in practice
- Explain evidence
- Evaluate performance

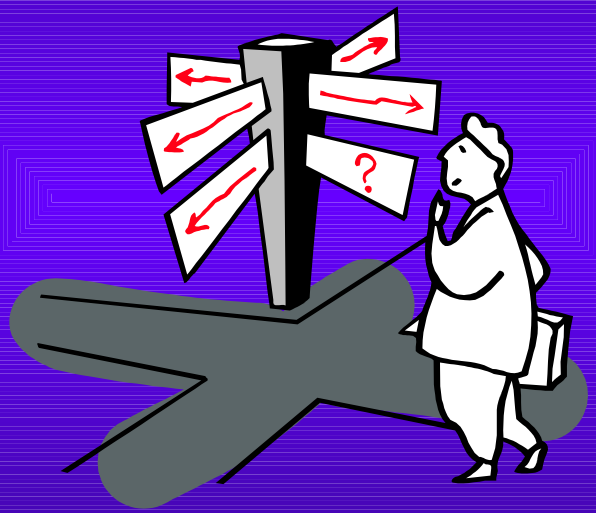
How Can EBHC Be Supported?

- Provide high level leadership commitment
- Train clinicians to do EBM
- Provide point of care evidence-based information
- Provide evidence-linked guidelines and support their implementation
- Educate patients to expect evidence-based interventions
- Provide access to system measures of evidence-based practice and outcomes

Summary

- EBHC required to address multiple challenges to medical knowledge and practice
- EBHC draws together the most valid evidence along with judgment and preferences
- EBP is ineffective without a supportive environment
- The challenge for health systems are to produce environments supportive of EBHC

Questions?



Evidence Based Healthcare

Traditional Paradigm

- Unsystematic Experience
  - -Anecdote
  - -Apprenticeship
  - -Expert opinion
- Pathophysiologic Rationale
- Clinical Intuition
- Possible Benefit

System

Resources

EBHC Paradigm

- Knowledge of
  - -Evidence &
  - -Strength of evidence
- Quantitative statement of benefit and risk
- Patients' values & preferences
- Informed decision-making

Medical Systems Do Not Support Answering Questions

- Practice environment not supportive
  - Reimbursement geared towards procedures and volume
  - Inadequate time
- Data sources inadequate
  - Not up to date
  - Too time-consuming to access
  - Not geared to questions docs have
- Education often inadequate
  - Many journal articles have significant biases
  - CME often interest-sponsored and didactic